

ORDER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WESTERN-PACIFIC REGION

WP 6000.14

9/1/92

SUBJ: MAINTENANCE CONTROL CENTER OPERATIONS IMPLEMENTATION PLAN

1. **PURPOSE.** This order provides guidance and direction for the phased implementation planning of Maintenance Control Center (MCC) operations in National Airspace System (NAS) Airway Facilities (AF) Sectors. It provides top-level requirements for achieving the phased implementation of MCC's and associated maintenance operations, and serves as regional-level guidance for developing sector MCC operations.
2. **DISTRIBUTION.** This order is distributed to the Regional Administrator level in AWP; to branch level in the Regional Airway Facilities and Air Traffic Divisions and to all GNAS and ARTCC Sectors with a Supervisory distribution.
3. **ACTION.** Airway Facilities Sectors shall prepare sector plans for implementation of phase 2 and phase 3 MCC operations under the policy and guidance established in this order. The region shall provide guidance and be a single point of contact for the sectors to develop sector MCC phase 1 operations in accordance with the national implementation plan. MCC operations shall be achieved, at a minimum, to the level described herein for each phase. Phase 1 shall be achieved by 12/92. Phase 2 shall be achieved by 12/94. Phase 3 shall be achieved by the year 2000.
4. **BACKGROUND.** The Western Pacific Region has established MCC's in the Golden Gate, Hawaii Pacific, Los Angeles, Phoenix, San Diego and Sierra Nevada General National Airspace System Sectors (GNAS) (GMCC). Oakland and Los Angeles Air Route Traffic Control Centers (ARTCC) MCC's (AMCC) are in developing stages. Southern California TRACON (VVR), yet to be established, will develop an MCC that will be formatted after the AMCC. Tandem computers are operating at the Hawaii Center Enroute Radar Approach (CERAP), Los Angeles and Oakland ARTCC's. VVR will operate a Tandem (or similar type) computer that will be an MMS node. MCC Operations Concept, Order 6000.39, contains the overall operations concept for the maintenance environment. Order 6000.39 promulgates MCC operations in AF sectors and describes the top-level requirements for conducting MCC operations in the NAS.
5. **APPROACH.** This directive presents a three-phased implementation approach that incrementally achieves Maintenance Automation 2000 concepts (MA2000) MCC operations objectives (defined in the operations concept, Order 6000.39) within the MCC operational and functional requirements stipulated in NAS-MD-794, Functions and Operational Requirements of the NAS Maintenance Control Center, and the Systems Operational organizational element as described in Order 1100.127C, Airway Facilities Sector Configuration (RIS: AF-1100-1). It explains how to implement the five major MCC functions defined in NAS-MD-794: real-time monitoring, non-real-time monitoring, control, communications/coordination and reporting.

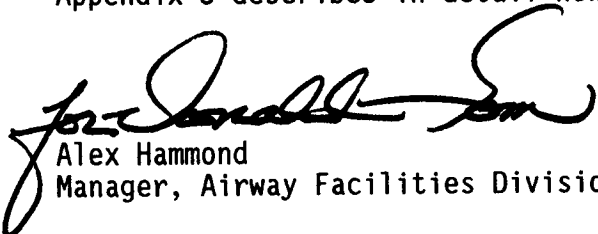
Distribution: A-X-1; A-X(AF)-3; A-X(AT)-3; A-FAF-2/3 (SUPV) **Initiated By:** AWP-460

6. OBJECTIVES. The phased approach to MCC operations implementation is intended to support the introduction of automation in the maintenance environment with minimum adverse cultural impacts to the technical workforce. The MCC will operate as the Systems Operations element as described in Order 1100.127C. Whereas implementation of phase-specific MCC functions is at the sector manager's discretion within the phase's time span, each MCC is required to have achieved all phase-specific functions by the end of the phase. This is necessary to achieve a uniform implementation of MCC operations.

a. Phase 1 Operations (1/92 to 12/92). The first phase of MCC operations implementation is intended to institutionalize MCC operations in the field. The objective is to provide an interim method for performing maintenance operations between the current, predominantly non-automated maintenance environment and the automation-supported maintenance environment that will be enabled by phase 2 equipment and connectivities. This phase transitions current Work-Center-based maintenance operations to a joint MCC/Work-Center-based system by establishing the MCC primarily as a coordination function in the sector. It is intended to accommodate sector maintenance operations that are either partially supported or unsupported by maintenance automation technology. Finally, phase 1 operations are intended to prepare AF sectors to perform and conduct some maintenance operations through use of the automation capabilities that will be available during phase 2 operations. Appendix 1 describes in detail how phase 1 will be accomplished.

b. Phase 2 Operations (1/93 to 12/94). Second-phase MCC operations are intended to increase the scope and authority of the MCC's coordination function, and to achieve centralized management and control of maintenance operations at the MCC. This will be supported by the introduction of MCC-resident computer systems that will interface with the Remote Maintenance Monitoring System (RMMS) to obtain real-time sector facility status information. This capability will enable the MCC to have first-hand knowledge of the status of facilities in its sector, enabling the MCC to manage and direct maintenance operations for the sector, and to focus Work Center responses to NAS maintenance actions. Appendix 2 describes in detail how phase 2 will be accomplished.

c. Phase 3 Operations (1/95 to 2000). The third phase of MCC operations implementation is intended to consolidate the MCC's centralized management and control of maintenance operations by taking advantage of full remote maintenance automation capabilities expected to be available after the year 2000. It is characterized by increasing automation of routine tasks, and by the capability to direct a highly-skilled technical workforce to specific maintenance activities. Phase 3 MCC operations represent achievement of the MA2000 operations concept by the year 2000 or beyond, depending on the automation capabilities supported by the implementation of RMMS in the NAS. Appendix 3 describes in detail how phase 3 will be accomplished.



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APPENDIX 1. MAINTENANCE CONTROL CENTER (MCC) IMPLEMENTATION
PHASE 1 (1/92 - 12/92) REQUIREMENTS

1. Scope. This appendix describes the requirements for implementing phase 1 MCC operations. It describes the functions and support elements to be established under the Systems Operations organizational element described in Order 1100.127C, Airway Facilities Sector Configuration (RIS: AF-1100-1) and the overall methodology for establishing them. This methodology may be supplemented and adapted to meet regional and sector requirements through regional and sector guidance as required. In this order the word "Sector" refers to both GNAS and ARTCC organizations.
2. Phase 1 MCC Operations Implementation Objectives. The objectives of the first phase of MCC implementation are: 1) transition current sector maintenance operations to a common basis from which to achieve the orderly implementation of phase 2 MCC functions, 2) institutionalize MCC's in the sectors with minimum adverse technical and cultural impact, and 3) provide centralized support and coordination capability to sector maintenance operations. This phase of MCC operations continues to require the existing, highly-skilled technician work force to accomplish on-site maintenance, and recognizes the retention of pride of ownership within that work force. Wide latitude is retained by each sector as to the implementation of required functions, however, all MCC's will achieve the minimum requirements set forth herein for phase 1 MCC operations by the end of the phase (12/92).
3. General Implementation Methodology. The MCC shall be established within the Systems Operations organization to execute its support and coordination functions from a central location within the sector. MCC location shall be located at the sector headquarters office. The MCC will monitor the status of facilities under its jurisdiction, communicate service interruptions to air traffic control facilities, sector management, Western-Pacific Systems Maintenance Engineering Branch, AWP-460 and the National Maintenance Coordination Center (NMCC), and coordinate maintenance activities associated with preventive and corrective actions. This will involve establishing the MCC as the single point of contact between Airway Facilities (AF) and Air Traffic (AT), and between AF and other users and service companies within the sector for coordination of maintenance activities. AWP-460 will be the single point of contact for the sector MCC's on going implementation. As a minimum, MCC's and AMCC's will meet on a semi-annual time frame throughout phase 1 and phase 2. Implementation of this phase does not require connectivity to the RMMS and its resources, however, sectors which possess such connectivity are expected to use available RMMS resources to the maximum extent possible during this phase of MCC operations. All Air Route Traffic Control Center (ARTCC) MCC's (AMCC's) possess connectivity to the Maintenance Processor Subsystem (MPS) in phase 1 time frame will be considered phase 2 MCC's and should conduct their operations as described in Appendix 2 where applicable.

4. Communications/Coordination. The MCC's primary role in phase 1 is to serve as a coordination and support center for AF maintenance operations. In addition to supporting the coordination function, communications will be performed in phase 1 to keep AF management apprised of sector-wide facility status in the absence of an established RMMS network. Implementation of a central point of MCC operations in phase 1 will encompass establishing the MCC as a central point of contact for the coordination of scheduled and unscheduled NAS maintenance activities. The MCC will be responsible for coordinating these maintenance activities. The SFO/Unit retains the responsibility for performing restoration activities. Although the MCC will be established as the sector's central point of contact, the AT/AF face-to-face activities shall be preserved where practicable. Whether coordination is initially achieved by the MCC or via face-to-face actions between AF and AT, the MCC will be kept apprised of interruptions of service within the MCC's area of responsibility.

a. Facility/Service Interruptions. Facility/service interruptions associated with the performance of Corrective Maintenance (CM) and Preventive Maintenance (PM) activities will be coordinated through the MCC during the MCC's hours of operation. All facility and/or service interruptions will be reported to the MCC by AT, AF or other sources. As each situation dictates, the MCC will notify the regional office and the NMCC of the interruptions, and of initial activities underway to restore the facility to service. The MCC will comply with the latest version of Order 6030.41, Notification Plan for Unscheduled Facility and Service Interruptions, and will coordinate restoration activities per sector orders and LOA's, as appropriate. The MCC will coordinate restoration activities as required with the appropriate SFO manager or unit supervisor, or directly with a technician to initiate an AF response to the loss of service. The MCC may attempt, with LOA's, service restoration through the RMMS where available. If additional sector, regional, or nation resources are required to restore service, the technician at the site, or the SFO manager or unit supervisor will contact the MCC for appropriate coordination actions. Service restoration will be reported to the MCC promptly. The MCC will report facility interruptions and on going facility/service restoration efforts to AT, sector management, the regional office, and the NMCC as required. The following requirements shall apply to PM/CM coordination:

(1) The SFO/Unit will advise the MCC of all routine shutdown schedules. The MCC will be used as a prime resource to resolve any shutdown schedule conflicts.

(2) The MCC will coordinate shutdowns with regional personnel and other entities outside the sector.

(3) The MCC will be kept apprised of the progress of restoration activities if an outage goes beyond the scheduled return to service (RTS) time, and will communicate this information to AT, sector management, AWP-467 and the NMCC as required.

(4) The MCC will obtain the minimum following information for coordination of scheduled shutdowns:

- (a) Anticipated downtimes and alternatives
- (b) AF field point of contact
- (c) Cause for the shutdown
- (d) Facilities involved
- (e) Affected runway (if applicable)
- (f) Prior coordination accomplished
- (g) Flight check requirements

(5) The MCC will maintain on file, all coordination points of contact necessary to facilitate shutdown coordination.

- (a) Adjacent facilities
- (b) Control points
- (c) Other affected facilities
- (d) Points of contact

b. Logistics Support Coordination. The MCC will assist the technician at remote sites in the acquisition of Priority-1 (P-1) parts for the restoration of critical facilities, and of P-2 parts for the restoration of stand-by equipment at critical facilities, when necessary. This assistance will consist of locating the required spare part(s) within the sector and/or initiating the spare parts request from the FAA Logistics Center. The MCC will establish and maintain a list of FAA Logistics Center and contractor depot contacts and telephone numbers to support this function.

c. NAS Facility/Service Communications.

(1) Voice Communications. The MCC's communications/coordination role will be fulfilled in phase 1 through the use of existing sector voice communications. The MCC will establish or update existing sector voice communications procedures as required for voice communications between:

- (a) AMCC and General NAS (GNAS) MCC (GMCC).
- (b) MCC and Sector Field Offices.
- (c) MCC and Regional Office.
- (d) MCC and AT contact(s).
- (e) MCC and NMCC/FAA Headquarters.
- (f) MCC and joint users.
- (g) MCC and other organization (public utilities, Military, police stations, etc.).

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(2) National Automated Performance Reporting System. The MCC will provide an overview function on interruption reporting to ensure timely and accurate outage and interruption reports in accordance with the latest revision of Orders 6000.15 and 6040.15.

(3) NOTAMS. The MCC will provide information for AT to issue and cancel Notices to Airmen (NOTAMS). This input concerns scheduled and unscheduled facility/service interruptions, and will be provided to designated AT contacts. The SFO's will provide this information during MCC non-operations hours, as required. NOTAMS input will be in accordance with FAA Order 7939.2, Notices to Airmen. The MCC will maintain a review of all current NOTAMS.

(4) GENOTS/RENOTS. The MCC will be the focal point for the dissemination of General Notice (GENOT) and Regional Notice (RENOT) information throughout the sector.

(5) Remote Equipment Operations. The SFO technician responsible for on-site maintenance of remotely monitored and maintained facilities will be notified whenever the MCC takes corrective action to remotely monitored and maintained facilities through the RMMS.

7. MCC Hours of Operation.

a. ARTCC MCC. The AMCC will operate continuously, 24 hours per day, 7 days per week.

b. GNAS MCC. The GMCC will operate a minimum of 8 hours per day, 5 days per week. The hours will be determined by the sector manager. GMCC's may operate in excess of the requirements as warranted by sector workload and supported by sector staffing.

8. Fold Down. During Phase 1 operations there will be no prescribed fold down operating procedures for the MCC. The AMCC will follow the fold down procedures already established at the ARTCC's. During MCC non duty hours at the GNAS sectors, maintenance technicians will report all critical interruptions to the regional duty officer, NMCC, AWP-467 and the MCC. Critical interruptions are defined as those that may cause impact to air traffic normal operations. The MCC and AWP-467 will maintain a telephone recording device during non duty hours.

9. Administrative Responsibilities.

a. Logs.

(1) MCC Activity Log. The MCC will maintain a daily automated log. The log entries will consist of the MCC's involvement in, but is not limited to:

- a. Scheduled outage coordination
- b. Technician call out
- c. Air Traffic advisories

- d. Facility failure/restoration
- e. Unscheduled facility interruptions advisories
- f. Daily activation/deactivation of the MCC
- g. Aircraft accident/incident involvement

(2) The MCC shall maintain standard FAA facility maintenance logs of any maintenance activities, including certifications, that are accomplished on any FAA facility from the MCC. This includes any maintenance accomplished on the MCC hardware and software, and all coordination actions performed with respect to facility/service interruptions, and restoring facilities to service. Paper logs shall be completed on FAA Form 6030-1, in accordance with FAA Order 6000.15B, General Maintenance Handbook for Airway Facilities. During phase 1, the goal will be to transition from paper-based to automated logging. Automated logging will be performed in accordance with MMS software logging procedures in Order 6000.15B.

b. Facility Reference Data File. MCC's shall have ready access to, at a minimum, the following Facility Reference Data File (FRDF) sections for all facilities which it monitors and controls: Section 4, FAA Forms 6030-16 and 6030-17; Section 5, Initial Technical Performance Data; Section 9, Facility Flight Inspection Reports; Section 11, FAA Maintenance Technical Orders; Section 12, Manufacturer's Instruction Books.

c. Data Access, Storage, and Retrieval. The MCC will establish and maintain the ability to access data from any source as required in the performance of its duties.

d. Call Back Lists. The MCC will maintain a sector call back list for facility restoration.

APPENDIX 2. MAINTENANCE CONTROL CENTER (MCC) IMPLEMENTATION
PHASE 2 (1/93 - 12/94) REQUIREMENTS

1. Scope. This appendix describes the requirements for implementing phase 2 MCC Operations. It describes MCC functions and support elements to be established in addition to those implemented in phase 1, those to be augmented or changed from phase 1 through the use of maintenance automation resources, and the overall methodology for implementing them. This methodology may be supplemented and adapted to meet sector requirements through regional guidance as required.

2. Phase 2 MCC Operations Implementation Objectives. The objectives of the second phase of MCC operations implementation are: 1) augment phase 1 MCC functions and responsibilities through installation and use of MCC-resident computer resources, and connectivity of those resources to the RMMS; 2) begin centralizing the management and control of maintenance operations; and 3) transition to end-state MCC operations. All MCC's will achieve the minimum requirements set forth herein for phase 2 MCC operations by the end of the phase (12/94).

3. General Implementation Methodology. The MCC's resident automation resources and connectivity to the MPS in phase 2 will allow the MCC access to RMM'd National Airspace System (NAS) facilities. This will impart to the MCC first-hand (real-time) knowledge of the status of the RMM'd facilities under its area of jurisdiction. Phase 2 MCC's will perform automated, real-time facility status monitoring of all RMM'd NAS facilities in their jurisdictions. They will perform limited remote control actions, remote equipment checks, remote certifications, and selected remote corrective and (routine) preventive maintenance actions on RMM'd facilities. The real-time status monitoring resource will enable the MCC to direct the technical workforce more effectively and efficiently. This in turn will enable phase 2 MCC's to transition their coordination role into a limited management and control role in AF maintenance operations. Phase 2 MCC's will become the central point of contact for most AF maintenance operations and coordination activities with AT. The level of automation will expand in phase 2 to bring paper-based documentation on-line. Automated display processing will provide real time facility status, weather data, and graphics.

4. Communications/Coordination.

a. Facility/Service Interruptions. Phase 2 MCC's shall maintain a real time awareness of all facility/service interruptions. The MCC will be the single point of contact for scheduled interruptions that require coordination external to the facility. The MCC will maintain sector, regional, and national personnel's awareness of all facility/service interruptions.

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b. Technician Notification. MCC will maintain a roster of technician's facilities of responsibility, Sector Field Office (SFO)/Sector Field Unit (SFU), and home telephone numbers. The MCC is responsible for notification of technician to respond to a interruption or incident.

c. Facility Control. In phase 2, facility status will be available to multiple points in the NAS (AT, AMCC, GMCC, NMCC, AFSFO, and on-site technician). Only one entity may control (i.e., issue remote or local control commands to) a facility at any one time. Implementation of the control function will require strict coordination rules for control of NAS facilities. Coordination rules will be jointly established by AF personnel from the regional to the facility level with AT concurrence. These rules shall be expressed in LOA's, region and sector orders, as necessary, and shall be applicable to all users.

d. Flight Inspections. The MCC will be the central point of contact for coordination all flight inspections. The MCC is responsible for AF and AT notification of information related to all impending and completed flight checks. For RMM'd facilities where a technician is not on site, the MCC will monitor the facility being checked and report to FIF0 any conditions impacting the flight check. The MCC's role in flight inspections will be implemented through region and sector orders, and will be conducted in accordance with procedures established in the MCC operational procedures manual.

e. Technician Travel. In cases of callback for restoration of remote facilities, the MCC will remain cognizant of the whereabouts of the technician during travel. The MCC will issue weather advisories as appropriate to assist technicians on travel to sites.

f. Aircraft Accident/Incident Investigations. The MCC will be the primary point of contact for all AF activities relating to aircraft accident/incident investigations. All notifications and investigations will be in accordance with FAA Order 8020.11, Aircraft Accidents and Incidents - Notification, Investigation and Reporting; and applicable regional and sector orders. The MCC will assist AT in determination of facilities involved in aircraft accident/incident.

g. GNAS Facility/Service Communications. Connectivity between GMCC's and their assigned MPS's using Multiple Local Area Network (MULTILAN) capability shall be established. At a minimum, telephone hot lines will be established and used for communications with level 5 AT facilities, and associated AMCC's. Other hot lines may be established, at sector's discretion, between the GNAS MCC and selected AT facilities.

5. Facility Monitoring. Phase 2 MCC's will perform real-time facility status and performance monitoring of all RMM'd NAS facilities under their jurisdiction through the implementation of MCC-resident computer resources, and the interface of those resources to the MPS. MCC's will use the information obtained from this capability to coordinate corrective maintenance.

a. Facility Monitoring Implementation.

(1) MCC-Resident Computer Resources. MCC-resident computer resources will be installed and integrated at all GMCC's at the beginning of phase 2 (1993). These resources will be comprised of a local area network, three workstations, automated status monitor display, and a weather/graphics display. These systems will interface with the MPS to obtain RMM'd facility status and to issue control commands to RMM'd facilities.

(2) Agreements and Procedures. Implementation of the MCC's monitor and control functions in phase 2 will require new LOA's to be established between and among: 1) GNAS and Center sectors for access to and use of MPS resources; 2) the MCC and AFSFO's for expanded MCC coordination authority; and 3) between AF and the previous control organization for control of RMM'd NAS facilities.

b. Facility Status Display. RMM'd facility status will be continuously displayed and automatically updated at the MCC on the status monitor display. Non-RMM'd facility interruptions (non-real-time status) reported to the MCC by users will be manually entered for display on the automated status monitor display.

c. Alarm Acknowledgement and Resolution. The MCC will acknowledge all facility alarms and take action to determine the cause of alarm. With letters of agreement established, the MCC shall issue control commands to return the equipment to normal operation. If the MCC cannot restore service remotely, appropriate personnel will be notified. The MCC will inform appropriate Air Traffic facilities of interruptions to facilities or services that impact their operations. After notification, the MCC will continue to track service restoration efforts. As appropriate, alarm resolution will include certification, notification of restoration, NAPRS outage reporting, and initiation of NOTAMS cancellation to AT.

6. Reporting. The reporting function (logging) will transition from paper-based to a predominantly automated function, as enabled by the MCC's connectivity to the MPS. The automated logging function in MMS software will be used by the MCC to the greatest extent possible. Automated logging will be performed on all RMM'd facilities where the MCC has maintenance responsibility.

7. Control. The MCC will issue control commands to RMM'd facilities where LOA's are established.

a. Precautionary Control Commands. The MCC will issue control commands to RMM'd facilities as necessary to attempt to prevent facility outages. These control commands may be initiated in response to anticipated impacts, i.e. adverse weather shown on the automated weather display; unstable commercial power; or unstable equipment operation.

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b. Equipment Resets. The MCC will perform equipment resets in an attempt to maintain optimum facility operation on RMM'd facilities under their jurisdiction. All information related to facility reset will be provided to the appropriate technical personnel.

c. Equipment Parameters. Remote parameter changes will not will not be attempted without prior coordination with the appropriate technical personnel. If commands are issued that will affect certification parameters, persons initiating the command must hold current certification credentials on the involved facility.

8. Sector Maintenance Operations. A team approach to sector maintenance operations will evolve at the sector manager's direction. The MCC and AFSFO's will collaborate on the implementation of planning, coordinating, and execution of sector-wide PM/CM activities. In general, the MCC will perform communications/coordination and status monitoring, and the AFSFO will perform PM and CM actions. The MCC will support the AFSFO in performance of maintenance operations as necessary to provide improved and efficient utilization of available resources.

a. Remote Maintenance Operations. The installation, integration and interface of MCC-resident computer systems will give the MCC capability to provide immediate response to facility/equipment failures, and the capability to perform preventive and corrective maintenance actions remotely.

(1). Remote Preventive Maintenance. The MCC may perform remote PM actions, as appropriate, to support sector maintenance operations. The MCC will develop adequate procedures to accomplish remote preventive maintenance on RMM'd facilities.

(2). Remote Corrective Maintenance. MCC remote corrective maintenance actions will include the capability to perform diagnostic and fault isolation tests, and equipment resets in an attempt to restore the facility/equipment to proper operating condition. The MCC will develop and implement adequate procedures to accomplish remote restoration of failed RMM'd equipment or facilities.

(3) Remote Equipment/Facility/Service Certifications. MCC certification authority may be granted by the sector manager to enhance sector maintenance operations. Remote certification may be performed by either the MCC or AFSFO Technician who possess appropriate certification credentials.

b. MCC Support of AFSFO Maintenance Operations. The AFSFO will receive support from the MCC in a team approach to maintenance operations. The AFSFO will perform the preventive and corrective maintenance actions on site that cannot be accomplished remotely. The MCC may request on-site verification of facility performance by AFSFO personnel. The MCC shall notify the AFSFO technical personnel of any corrective actions taken and may request on-site facility certification.

9. Hours of Operation. GMCC operating hours will expand from the minimum 8 hours per day, 5 days per week to 24 hours per day 7 days per week operation by the end of phase 2. Exceptions will be with regional concurrence only.

10. Fold Down. By the end of Phase 2 all MCC's shall establish written, published, and coordinated fold down procedures. These procedures will describe the accepting MCC's responsibilities and the procedures for reversing the fold down process. The following minimum procedures shall be observed to accomplish fold down:

a. The folding MCC shall communicate all information pertinent to local operation as well as facility status to the accepting MCC.

b. The folding MCC shall place all required telephone lines on call forwarding.

c. The folding MCC shall transfer MPS alarm data to the accepting MCC.

11. Weather.

a. Scheduled Facility Shutdown Support. The MCC will furnish weather information to all interested parties, as required to perform the scheduled shutdown.

b. Precautionary Measures. The MCC will issue remote control commands to RMM'd facilities to deter weather-related facility outage, or to reduce potentially detrimental impacts of weather on facility performance. The MCC will advise FAA users and technical personnel of potential weather impacts to facility operation.

c. Technician Travel Advisories. The MCC will advise technicians of any adverse travel conditions that may impact travel to and from facilities.

12. Maintenance Documentation.

a. Automated Maintenance Documentation Requirements. MCC's and AFSFO's will use MMS software automated logging capabilities to record maintenance actions of remotely monitored (RMM) facilities. PM scheduling for all facilities remotely monitored and controlled by the MCC will be implemented by the end of phase 2.

b. MCC Activity. The full capabilities of MMS software will be utilized to support automated daily MCC logging as outlined in phase 1. All daily activities pertinent to the MCC operation shall be entered into the activity log.

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c. Paper-Based Maintenance Documentation. All paper-based logging will be continued until such time that automated logging becomes available.

d. NAS Facility Maintenance Handbooks. The MCC shall have ready access to NAS facility maintenance handbooks for each type of facility which the MCC monitors and controls.

APPENDIX 3. MAINTENANCE CONTROL CENTER (MCC) IMPLEMENTATION
PHASE 3 (1/95 - 2000) REQUIREMENTS

1. Scope. This appendix describes the requirements for implementing phase 3 maintenance control center (MCC) operations. It describes MCC functions and support elements to be established or augmented from previous phases, and the overall methodology for implementation. This methodology may be supplemented and adapted to meet sector requirements through regional guidance as required.
2. Phase 3 MCC Operations Implementation Objectives. The main objective of the final phase of MCC operations implementation is to fulfill the requirements for Maintenance Automation 2000 (MA2000) environment. These requirements involve augmentation of MCC maintenance automation resources to the fullest extent possible. The attainment of full MA2000 MCC maintenance automation capabilities is ultimately dependent upon the full implementation of the Remote Maintenance Monitoring System (RMMS) in the National Airspace System (NAS). Phase 3 operations implementation is expected to consolidate centralization and management of maintenance operations in the MCC. The maintenance team philosophy to which operations have gradually transitioned during phases 1 and 2 is expected to become fully mature in this phase.
3. General Implementation Methodology. MCC adaptation to the Phase 3 requirements is dependent upon full implementation of the RMMS.
4. Communication/Coordination.
 - a. Equipment Modification. The MCC will support shutdown coordination and crew scheduling among technical personnel, and will be centrally involved in the resource acquisition and coordination as required to implement modifications to NAS equipment and facilities.
 - b. Routine Advisories. The MCC will provide an advisory function to the technical staff based on the MCC's overall knowledge of the sector maintenance status. The MCC will advise appropriate personnel of any overdue required maintenance activities. The MCC will keep personnel informed of any detected facility or equipment trends that may adversely affect or degrade service.
5. Reporting. Reporting functions will be fully implemented by the end of phase 3.
 - a. Paper-based logging will only be used where the MPS is not available.
 - b. National Automated Performance Reporting System (NAPRS) reporting will be fully automated in MMS software. A log entry will automatically be opened in MMS software for all scheduled and unscheduled facility shutdowns. The shutdown will in turn automatically be reported to NAPRS.
6. Control. Control functions will expand with the advancement of RMS

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capabilities. MCC control functions will include performance of full range remote diagnostics, fault isolation, adjustments, preventive and corrective maintenance. Expanded control functionality will include capability to initiate and ascertain results of remote diagnostics, remote fault isolation, and remote equipment adjustments.

a. Remote Diagnostics. The MCC will use RMS-provided diagnostics to determine facility operating conditions, and detection of equipment problems. MCC personnel using these capabilities will be required to have sufficient training to interpret results of diagnostics. No automatic diagnostic routine will place a facility in an unsafe or out-of-tolerance operating condition unless the facility has been removed from service.

b. Remote Fault Isolation. The MCC may perform remote fault isolation to troubleshoot equipment. The information obtained as a result of fault isolation may be used by the MCC to initiate remote CM actions, or to direct and coordinate corrective actions by technical personnel.

c. Automated Maintenance Control. The MCC may initiate automated preventive maintenance control commands to the greatest extent possible.

7. Maintenance Operations. LOA's shall be revised and updated to accommodate the expanded operations of the MCC. Technical staff will receive support from the MCC in a team approach to maintenance operation.

8. Level of Automation. The main goal of MCC automation in phase 3 is to achieve full maintenance operations management and control. Automation will be applied to tasks, or portions of tasks, that are routine and require no human interpretation or intervention. A subordinate goal is achievement of a paperless environment.

a. MCC-Resident Systems. MCC-resident systems shall be updated to "state of the art" as enhancements become available.

b. MPS-Resident Software.

(1) NAS Facility Maintenance Handbooks. The MCC is responsible for maintaining updates to NAS Facility Maintenance handbooks. Updates may be downloaded via the MMS software network.

(2) Facility Reference Data Files (FRDF). MCC will make full utilization of the FRDF resident on the MPS.

(3) Automated Reporting Systems. Facility interruption reporting to the regional office and the NMCC will be fully automated during phase 3 MCC operations. The real-time facility status monitoring function will be automated to the NMCC level. In the real-time environment, NAPRS reporting of an interruption will be automatically generated (log entry will auto-matically be opened in MMS software). Automatically opened reports shall be closed manually.

c. Monitor and Control Software.

(a) Automated Maintenance Command Script Files. The MCC is responsible for ensuring that locally generated monitor and control software files contain no invalid commands that will degrade facility performance unintentionally.

(b) Facility Technical Performance Records (6000 series). The MCC shall make full utilization of the automated 6000 series forms residing on the MPS.

(c) Facility Technical Performance Analysis. The MCC shall download facility technical performance data from the MPS. The MCC and Technical Support Specialists shall utilize the data for facility performance analysis.